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ABSTRACT

The guiding principles incorporated into this program are: 1) to develop a kindergarten through twelfth grade curriculum in a logical sequence to provide continuity and progression in the program; 2) to have the program enhance the instructional goals of the school system; 3) to link the subject areas that relate most closely to conservation, especially science and social studies, so that knowledge important in understanding and solving resource problems is properly developed; 4) to give the learner an opportunity to study natural resources of the community through field trips, emphasizing local resource problems; 5) to stress attitudes and not vocational skills with the student playing an active role in the learning process through personal experiences and thinking; and, 6) to provide a comprehensive inservice teacher training program for the entire school year. The details are given on program development and design, implementation, operation, and evaluation, specifically, curriculum themes and objectives, resource site selection, teacher and student orientation, schedules, field trips, materials and classroom presentations, and program coordination. (SBE)

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INTEGRATING CONSERVATION EDUCATION INTO THE EXISTING CURRICULUM OF THE ANN ARBOR PUBLIC SCHOOL SYSTEM (K-12)

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INTEGRATING CONSERVATION EDUCATION INTO THE EXISTING CURRICULUM OF THE ANN ARBOR PUBLIC SCHOOL SYSTEM (K-12)

CHAPTER I

ANN ARBOR'S OUTDOOR AND CONSERVATION EDUCATION PROGRAM

Introduction

One of the most important challenges of conservation today is to develop an effective method of implementing conservation education into our school systems. If we are to move ahead in the field of conservation and successfully meet the conservation challenges of the future, we must develop aroused and informed citizens who will take an active role in local, state, national, and international resource issues.

In our political system, we depend upon the wisdom of individuals of the populace for making decisions. The responsibility of helping our future citizens to obtain the knowledge and incentive necessary to make wise decisions has been vested in our school systems. Since conservation education is essential to our type of political system it is important for school administrators to ask if their school system is effectively fulfilling its responsibility to society.

Dr. Arthur D. Barfield, director of the Conservation Material Center, University of Massachusetts, just recently made the following statement:[1]

> Despite noticeable efforts on the part of communities and states to develop wholesome conservation attitudes and habits, it is common knowledge that much remains to be done in this direction. While radio, television, and various printed materials provide information pertaining to the wise use of resources, we cannot rely upon or expect these media to accomplish the ultimate objective -- the development of life long conservation understandings by the American Public. It remains, then, that an approach is needed which will not only guarantee the dissemination of accurate information, but the instillation of desirable attitudes and understandings of conservation education as well. Since experience has demonstrated that we must teach with these objectives in mind and not leave their realization merely to chance, it goes without saying that the schools offer the most natural and logical setting for meeting this end.

[1]Barfield, Arthur, D. "A New Look at Conservation Education." Science News IX No. 2 (Winter, 1963).

> Ironically, our educational institutions have played, at best, a minor role in the conservation education movement. Traditionally, some schools have attempted to integrate conservation education into the existing curriculum while others have made progress through offering conservation courses per se. Whatever the approach, available evidence suggests the need for greater emphasis upon this phase of the child's education.

If we are to equip the individuals of our society to make the kind of resource decisions that our nation will face in the future, our schools must embark on a comprehensive conservation program that will span the curriculum, kindergarten through the twelfth grade, and link the subject areas that relate most closely to conservation. This type of a program could stress the characteristics, interrelationships, and uses of our natural resources in the elementary grades, and emphasize the levels of management and policy at the secondary level. This approach to conservation could be made even more favorable to school systems if conservation could be integrated into a school system's existing instructional goals.

The provisions mentioned above have been incorporated into a conservation education program and integrated into the existing curriculum of the Ann Arbor Public School System, (K-12).

Description Of The Ann Arbor Public School System

The Ann Arbor Public School System is located in Ann Arbor, Michigan. Ann Arbor is the largest city and county seat of Washtenaw County, and is located in the southeastern part of the state. In July, 1963, the Washtenaw County Planning Commission estimated the population of Ann Arbor at 71,400.

There are twenty-five public schools, four parochial schools, and one university elementary, junior, and senior high school in the city of Ann Arbor. Within the Ann Arbor Public School System there were approximately 8,466 students in the twenty-one elementary schools, 2,749 students in the three junior high schools, and 2,425 students in the senior high school, during the 1962-63 school year.

General Procedure

To develop a conservation education program for the Ann Arbor Public School System (K-12), the following procedures were followed:

1. Designing the program
   a. Established a set of guiding principles that should be included in a conservation education program.
   b. Examined the science and social studies program and identified conservation elements in the existing curriculum.
   c. Developed themes and understanding for each elementary grade level that would link the subject matter of the exisiting science and social studies curriculum and would provide the desired continuity and progression in the program.
   d. Selected conservation topics to be integrated into secondary science and social studies courses.
   e. Developed an organizational structure which would facilitate the integration of conservation understandings into the existing framework of the Ann Arbor Public Schools.

2. Preparation of materials
   a. Prepared content material on the theme and understandings developed for each elementary grade level.
   b. Prepared content material on each of the conservation topics selected by secondary science and social studies teachers to be integrated into their courses.
   c. Developed charts for each elementary grade level to help prepare the learner for the field trip experience.
   d. Developed a series of Kodachrome slides to enhance the classroom presentation of each conservation topic being integrated into the secondary science and social studies program.

3. Preparation of Teachers
   a. Provided inservice training workshops for elementary and secondary teachers.
   b. Provided elementary and secondary teachers with information on current conservation issues, in addition to the substantive material mentioned in the preparation of materials.

4. Evaulation of the program

   a. An open-end qualitative evaluation was sent to administrators (superintendent of schools, assistant superintendent in charge of curriculum, social studies coordinator, science coordinator, and secondary and elementary principals) and classroom teachers (secondary social studies teachers, secondary science teachers, and elementary teachers). The administrators and classroom teachers were asked to recall and record by brief statements what features of the conservation program were helpful, in their opinion, in approaching the instructional goals of the Ann Arbor Public School System.

   b. A quanitative evaluation was sent to teachers (secondary social studies teachers, secondary science teachers, and elementary teachers), after all qualitative evaluations were returned, asking them to respond to a series of questions by circling one of ten points on a nongraded scale. They were also asked to respond briefly to several additional questions. One question was directed to new kinds of attitudes and interests observed in students as a result of this program. A second question requesting information concerning ways of improving the conservation program.

Early Roots of the Ann Arbor Program

In tracing the early roots of the Outdoor and Conservation Education Program in the Ann Arbor Public Schools, it is important to realize the receptivity of the Ann Arbor School System to the program as a result of their long interest in outdoor education. Ann Arbor was one of the pioneers in school camping, and teachers who felt qualified to extend classroom experiences to the out-of-doors have long been encouraged to do so. As early as 1933, a definite plan was established in the junior high schools to integrate field trip experiences into the total school program.

During the 1959-60 school year, members of the local Audubon Society created a nature center on a private parcel of land 9 miles from Ann Arbor. The local Audubon Society offered their services and the use of this land as a resource site for elementary science trips. During the spring of 1960, one of the elementary schools was selected as a pilot school to bring classes by appointment for guided field trips through the nature center. As a result of the general enthusiasm expressed by the children and teachers of the pilot school, the nature center was opened to all schools in the system the following year.

In January of 1961, the local Audubon Society made a proposal to the Ann Arbor Board of Education to employ a program coordinator to direct and expand the Outdoor Education Program that they had initiated. The Board of Education agreed to hire a program coordinator to direct the program on a trial basis for one year.

Guiding Principles of the Program

Before accepting employment with the Ann Arbor Public Schools, the program coordinator made a thorough study of the works of many widely known writers and authorities in the field of conservation education. A set of guiding principles that the program coordinator thought should be incorporated into an Outdoor and Conservation Education Program were then formulated. These guiding principles are:

1. The Conservation program should span the curriculum, kindergarten through the twelfth grade, so that conservation understandings can be presented in a logical sequence at the time that the learner is most receptive to the material presented. Isolating conservation as a single course limits the scope of the program and the number of students exposed to conservation understandings.
2. The Conservation program (K-12) should provide continuity and progression in the program, so that the understandings developed in one grade will grow and be expanded in subsequent grades.
3. The conservation program (K-12) should link the subject areas that relate most closely to conservation, especially science and social studies, so that both the social and scientific knowledge important in understanding and solving resource problems are properly developed.
4. The conservation program (K-12) should be integrated and correlated with the existing curriculum in a manner that will enhance the instructional goals of the school system.
5. The conservation program should give the learner an opportunity to study some of our community natural resources under natural conditions. This provides certain learning experience that can not be duplicated within the school building.
6. The conservation program should stress attitudes and not vocational skills. The most important conservation impact that most of our urban children will have upon our natural resources will be through their action as community citizens.
7. The conservation program should emphasize local resource problems so that our future community citizens will have the incentive and tools to cope effectively with our current and future resource problems. However, the conservation program should not neglect regional, national, and international resource problems.
8. The conservation program should be handled in such a manner that the learner plays an active role in the learning process. The learner develops attitudes through personal experiences and thinking and not through the presentation of predigested conclusions.

9. The conservation program should provide a comprehensive in-service training program for teachers which would operate throughout the school year and would be directed at helping teachers increase their understandings, interest, awareness, and teaching skills in conservation.

Upon establishing the guiding principles of the Outdoor and Conservation Education Program, the program coordinator met with the Superintendent, Assistant Superintendent in charge of curriculum, and the director of personnel to make certain that their philosophy regarding the development of the program was consistent with those stated in the guiding principles. The administrators responded favorably to the guiding principles of the program and the program coordinator proceeded to integrate an Outdoor and Conservation Education Program into the existing curriculum of the Ann Arbor Public School System.

CHAPTER II

DEVELOPMENT OF THE ELEMENTARY PHASE OF THE OUTDOOR AND CONSERVATION EDUCATION PROGRAM AND INTEGRATING IT INTO THE EXISTING CURRICULUM OF THE ANN ARBOR PUBLIC SCHOOLS (K-6)

Development of the Elementary Phase of the Program

The First Major Stage

In the development of the elementary phase of the Outdoor and Conservation Education Program in the Ann Arbor Public Schools, the first major stage was to become familiar with the purpose, objectives, and the general scope and sequence of the elementary science and social studies program. To determine this information the program coordinator examined the teachers' guides and textbooks in science and social studies for each of the elementary grade levels.

The Second Major Stage

The second major stage was to determine the most effective plan for integrating the elementary phase of the program into the existing curriculum of the Ann Arbor Public Schools. This was achieved by having the program coordinator meet with the science coordinator and an elementary planning committee, composed of an elementary principal and representatives of the lower and upper elementary levels. Meeting with this committee gave the program coordinator:

1. The opportunity to become acquainted and to plan with some of the teachers and administrators of the elementary program.

2. An opportunity to express and to receive ideas regarding the possible scope and operation of the elementary phase of the Outdoor and Conservation Education Program.

3. An opportunity to become more familiar with the general program and routine of the elementary schools in the Ann Arbor Public Schools.

4. An opportunity to discuss grade-level themes and field-trip sites.

5. An opportunity to discuss the operation and time sequences of the elementary phase of the Outdoor and Conservation Education Program.

The Third Major Stage

The third major stage was to develop themes, understandings, and subunderstandings for each grade level. To develop a theme for each elementary grade level, the coordinator reexamined the science and social studies curriculum guides for each grade level and made a list of all concepts and understandings mentioned in the science and social studies teachers' guides that pertained to outdoor and conservation education. From each of these grade-level lists, the Conservation Coordinator developed a grade level theme. To aid in the development of each grade-level theme, the program coordinator developed six understandings for each theme by reexamining the list of concepts and understandings used in developing each grade level theme. Subunderstandings were also developed for each of the six grade-level understandings. Some supplementary material was used in the development of the subunderstandings in order to provide the desired continuity and progression in the total program. The theme and understandings developed for each grade level are listed below:

Kindergarten theme: The number and kinds of living things that we see around our school and neighborhood vary with the four seasons. These plants and animals affect each other and help to serve many of our needs.

1. Around our school there are many different kinds of plants and animals.
2. Each kind of plant and animal has certain requirements and these determine where it can live.
3. Plants and animals live together and depend on each other for some of their needs.
4. Plants and animals are very important to man because they help to serve many of our needs (food, clothing, transportation, shelter, pleasure).
5. Each of the four seasons has its own kind of weather conditions. The number and kind of living things that we see change with the four seasons. Our activity also varies with seasons.
6. Fire can help to serve many of man's needs, but when out of control can be very harmful.

First-Grade theme: Birds and mammals (including man) provide homes for their young and help to serve their daily needs.

1. Animals live in many different kinds of homes. Some animals build their homes, and others use homes provided by nature.
2. Animals use their homes for many purposes (raising young, storaging food, shelter, escape from danger).
3. A wild animal's family serves many of the same needs as ours.
4. Some animals need more parental care than others.

5. An animal's body is normally well fitted (adapted) for the place where it lives and to obtain the particular type of food that it eats.

6. Animals have a habit of living in a certain kind of area. This area is known as its habitat (meadow, forest, pond, etc.). Within the proper habitat an animal is able to satisfy all of its needs. Habitats are sometimes changed by man.

Second-grade theme: Plants of any community are dependent on their neighbors (animals, soil, other plants) to meet many of their needs. Plants of a forest community help to supply many of our wants and needs. How can we in return help the forest community?

1. Water, wind, heat, and cold act upon rocks to weather them. Soil is composed of minerals weathered from rocks, living and dead organisms, water, and air. Most plants need soil in which to grow.

2. Plants growing together form communities. Each member of the community influences its neighbor.

3. There are many different kinds of plants. Each kind of flowering plant has its own type of roots, stem or trunk, branches, and leaves. These help to identify the plant. Each kind of plant is fitted (adapted) to live in a particular environment.

4. There is a very close relationship between plants, animals, and soil. Each helps the other in many ways.

5. Many products of a forest community are used by man. There are many ways that we can help a forest community.

6. A community like Ann Arbor and a forest community are similar in many ways.

Third-grade theme: Plants and animals that live in bodies of water (like the sea, lakes, ponds, etc.) are very dependent on each other and their physical environment. If these bodies of water are not polluted they can continue to serve many of our community needs.

1. Much of the earth's surface is covered with water. Many different kinds of plants and animals live in the water.

2. The water in the ocean is steadily being removed by evaporation into the air and replenished by precipitation and land drainage.

3. Aquatic plants and animals have special adaptations which make it possible for them to live in water.

4. Most aquatic animals are able to get the oxygen they need from their surrounding water.

5. The tiny animals that are suspended in water depend on small plants for food. These small plants and animals are called plankton and provide food for many larger animals. Many of these animals furnish an important food supply for man.

6. Man makes use of streams, lakes, and the sea to provide many of his personal and community needs.

Fourth-grade theme: We must understand the needs and habits of our wildlife, the value of our trees, and apply the proper management practices if we are to continue to enjoy the benefits they provide.

1. Plants and animals are dependent on each other and their non living environment.

2. A balance in nature is maintained through the interrelationship of plants and animals and their nonliving environment.

3. Natural predation is necessary in order to maintain a healthy population of certain species in balance with the environment.

4. Our Michigan forests yield many essential products for man's use (sawlogs, pulpwood and paper, plywood, chemicals, sawdust and chips, wildlife, etc.).

5. Forests have many natural enemies (disease, wild animals, domestic animals, man, fire, and weather).

6. Foresters use various practices in managing a forest (insect control, fire control, harvesting practices, thinning, reforestation). Woodlot owners can obtain technical advice and assistance in managing their forests.

Fifth-grade theme: If an area of land (such as grassland) is left undisturbed in Michigan, there will be a natural succession of communities from grassland to a forest. Each community will be characterized by particular plants and animals. Communities can be managed to meet our needs.

1. Plants and animals are normally adapted to live in a particular environment (habitat). As the environment (habitat) changes, many of the plants and animals inhabiting the area will change.

2. Flowering plants produce seeds from which new plants will grow if the environmental conditions are proper for that species.

3. The reproductive capacity of animals varies greatly, but normally each kind of animal produces far more offspring than the environment can support. Most animals die before reaching the age of reproduction. The natural causes of these losses are starvation, predation, disease, accidents, etc.

4. Many flowers will produce seeds only if the pollen comes from a different flower of the same species (insect pollination, wind pollination). The part of the plant that contains the seed is called the fruit. Animals that eat the fruit may disperse the seed.

5. As plants grow on an area of land they produce a set of conditions which are different from those which existed before the plants grew there. Under the new set of conditions other plants are more successful in competing for food, light, water, etc., and normally crowd out the previous plants.

6. Man has learned to adjust himself to the environment and to manage the environment in order to meet his desired needs (food and cover planting, flooding, cutting fire, etc.).

Sixth-grade theme: The relationship between resources are complex, and the management of any one resource requires careful consideration of the probable effect upon others.

1. When one kind of plant or animal is destroyed or reduced in number or becomes too numerous for the environment to support, other plants or animals are affected.

2. Water is constantly evaporating from the earth into the air. Water in the air condenses and falls back to earth again. This is a continuous cycle and is very important to life on earth.

3. Soil erosion is influenced by soil texture, water and wind action, steepness of the land, kind of cover on the land, and the seasons. The soil can be conserved and improved by proper conservation practices.

4. Some of the water that falls on the land runs off the surface, some goes underground by seeping through little air spaces in the soil but stops when it reaches a nonporous layer. The top line of the water is called the water table. Swamps and marshes occur where the water table is close to the surface of the ground or slightly above it.

5. The living world maintains balance through cycles.

6. Land management practices in a watershed influences the welfare of all people living within the watershed.

The Fourth Major Stage

The fourth major stage was to develop the structure of the program. The following structure has been used in the program.

Making an appointment: Teachers requesting appointments telephoned the secretary at the Office of Instruction and made a field trip and an orientation appointment. They then made a bus appointment by calling the secretary of the school bus transportation service. Confirmation of all appointments was sent to the teachers one week prior to the orientation day.

Grade level understanding check list: This lists the theme and six understandings for the teacher's grade level. The teacher checked the conservation understanding already discussed with the students, and the conservation understandings the teacher would like to have especially emphasized in the orientation and field trip. The "grade level understanding check list" is sent to the teacher one week prior to the orientation and is filled out and returned by the teacher to the program coordinator two days prior to the orientation. In other words each grade level presentation is patterned around the particular needs of each class.

Orientation: The orientation was scheduled on the Thursday prior to the field trip and consisted of a short presentation by the program coordinator (using visual aid material) to lay a foundation for the field trip and to answer any questions that the teacher might have concerning the trip (subject matter, procedure, clothing, etc.). The following schedule was used in the orientation:

4th, 5th, and 6th Grades	1st, 2nd, and 3rd Grades
8:30 - 9:10	12:50 - 1:25
9:40 - 10:20	1:55 - 2:25
10:50 - 11:30	2:50 - 3:15

Field Trips: Field trips were available for elementary classes between mid-September and Thanksgiving vacation; and between mid-March and the end of May. The fourth, fifth, and sixth grade classes were scheduled in the morning period to allow for longer field trip experiences. Each grade level was scheduled for a particular day so that private landowners would know in advance when to expect groups, and assistant field trip guides, available at one time-period a week, could concentrate their effort on one grade level.

Weekly schedule

	Monday	Tuesday	Wednesday
A.M.	4th Grade	5th Grade	6th Grade
P.M.	1st Grade	2nd Grade	3rd Grade

Daily schedule.

First, second, and third grades:

1:00 -- departure from school

1:30 -- approximate arrival at site

2:30 -- approximate departure from site

3:00 -- arrival at school

Fourth, fifth, and sixth grades:

8:45 -- departure from school

9:10 -- approximate arrival at site

10:50 -- approximate departure from site

11:15 -- arrival at school

Rainy days: In case of inclement weather the teachers and program coordinator would confer at the school, and the teacher would make the final decision about rescheduling the field trip. Fridays were left open for this purpose.

Follow-up: The program coordinator reviewed the highlights of the trip and answered individual questions on the return bus trip. In addition, teachers were given a "Teacher's Kit" prior to the orientation which contained mimeographed material prepared by the program coordinator and miscellaneous publications useful in reviewing and extending the learning experiences.

Recommended field trip site: The following field trip sites were recommended for each grade level, however, a teacher could request another resource site:

First grade -- Eberwhite Woods

Second grade -- Karmann Nature Center

Third grade -- Vertebrate Museum

Fourth grade -- Karmann Nature Center

Fifth grade -- Conservation Outdoor Laboratory

Sixth grade -- Deppmann Farm

The kindergarten program consisted of a 20-25 minute indoor presentation made by the program coordinator on "how plants and animals prepare for the winter months and live during this period of time." Charts and specimens were used in the presentation to help illustrate the interdependence of plants, animals, soil, and water.

The Fifth Major Stage

The fifth major stage was to locate a resource site that was appropriate for developing each grade level theme. This did not present any problems. Two of the resource sites used in the program were controlled by the Board of Education, Eberwhite Woods and the Conservation Outdoor Laboratory. Eberwhite became the resource site for the first grade, and the Conservation Outdoor Laboratory was used by the fifth grade, Mr. and Mrs. Karmann's property, the Karmann Nature Center, was used to develop the theme and understandings for the second and fourth grades. The University of Michigan's Vertebrate Museum was selected as the third grade resource site. The district forester and local soil conservation service agent were helpful in suggesting the Deppmann Farm as the resource site for the sixth grade. During the two years that the Outdoor and Conservation Education Program has operated, six additional privately owned resource sites within ten miles of Ann Arbor have been offered. Four of these sites have been used extensively. Resource sites adjoining schools have been used as an alternative field trip site.

The Sixth Major Stage

The sixth major stage was to contact, orient, and train a group of assistant field trip guides. Realizing that an important key to a successful field trip is leadership, a great deal of effort was placed in obtaining guides that possessed a genuine interest in children and in the Outdoor and Conservation Education Program. In order to provide the proper leadership, it was felt that a group of seven or eight assistant field trip guides would provide the proper student-leader ratio[1] for the six field trips per week. The program coordinator always served as one of the guides and the assistant field trip guides generally led one trip per week. As a result of the early program sponsored by the local Audubon Society, four excellent community leaders were available to assist in the program. Realizing that leading field trips is an extremely valuable experience for students considering educational work, the program coordinator thought it important to use University of Michigan students. By placing notices on several bulletin boards, there were enough student requests to meet the desired student-leader ratio. During the first year of operation ten University of Michigan students[2] received leadership experience.

[1]The desired student-leader ratios for the elementary grades were: first grade, 1:8; second grade, 1:10; third grade, 1:10; fourth grade, 1:15; fifth grade, 1:15; sixth grade, 1:15.

[2]Seven students from the Conservation Department, School of Natural Resources, participated in the program.

Upon procuring the guides, a booklet was given to them containing information on trail leadership techniques, organization and operation of the Outdoor and Conservation Education Program, and content material on each grade level. After the leaders selected the grade level they wished to lead, the program coordinator took them to the resource site used by that particular grade level in order to assist them in developing a familiarity with the land, suitable places on the trail to develop important grade-level understandings, and to discuss trail leadership techniques. A new leader would always accompany an experienced guide for one or two trips before leading a small group. Finding adequate leaders from the community or the university has not presented any special problems. Since the program has been in operation, many members of the local community have volunteered their services as assistant field trip guides. The local Audubon Society contributed $400 a year to the Outdoor and Conservation Education Program for payment of services rendered by the assistant field trip guides. The guides were paid $1.75 per hour for their services.

The Seventh Major Stage

The seventh major stage in the development of the elementary phase of the Outdoor and Conservation Education Program was to orient the secretaries in the Office of Instruction concerning orientations and field trip appointments, and the confirmation of all appointments. One secretary, in the Office of Instruction, was given primary responsibility. This secretary would receive field trip and orientation appointment telephone calls from elementary teachers and record the teacher's name, elementary school, number of students, and the teacher's room number in a field trip and orientation appointment booklet. Field trip and orientation appointments were confirmed one week prior to the orientation.

The Eighth Major Stage

The eighth major stage was to develop charts to help prepare the learner for the field trip experience. A set of charts was especially prepared for each grade level to help the learner visualize some of the important understandings developed for his grade level. The program coordinator visited the classroom on the Thursday prior to the field trip to lay a foundation for the field trip experience. The program coordinator presented the orientation in such a manner that the learner played an active role in the learning process. Each orientation emphasized the particular understandings requested by the classroom teacher on the "Grade-Level Understanding Check List."

The Ninth Major Stage

The ninth major stage was to orient the teachers to the program, to prepare material to assist the teachers in preparing the learner for the program and in extending the learner's experience following the program, and providing an in-service training program for teachers.

To orient the elementary teachers to the program, the program coordinator developed an "Outdoor and Conservation Education Program Guide" which was distributed to all elementary teachers and principals during the school system's orientation week. This booklet stated the philosophy, organization, and operation of the program and informed the classroom teacher as to the procedure for making a class appointment.

The "Teachers' Kit" was prepared for each grade level and sent to the teacher one week prior to the class orientation period to provide the classroom teacher with material useful to: (1) broaden her personal background, (2) prepare her class for the Outdoor and Conservation Education Program, and (3) extend the child's learning experience following the field trip. The "Teachers' Kit" included written material on the themes and understandings developed for the teacher's grade level to assist her in preparing the class for the Outdoor and Conservation Education Program. To aid the teacher in extending the learner's experience following the field trip, material on several suggested continuing activities was prepared and placed in the "Teachers' Kit." Several publications pertinent to the teacher's grade level were also placed in the "Teachers' Kit" to help broaden her knowledge of the grade-level theme and understandings.

To orient the elementary teacher to the resource site and field application of the theme and understandings developed for her grade level, a series of grade-level field trips were conducted during the school year. Additional in-service training sessions were also provided in the form of interlevel presentations and in the preparation and distribution of outdoor and conservation educational material.

Operation of the Elementary Phase of the Program

In operation, every elementary teacher in the Ann Arbor Public Schools had an opportunity to make an appointment to have her class guided through one of several resource areas in our community during the fall or spring months. The presentation of the program consisted of three separate phases: orientation, field trip, and follow-up. Prior to the classroom orientation, contact was made between the teacher and the program coordinator to determine what understandings pertaining to the field trip theme had already been discussed with the class, and what understandings the teacher would like to have especially emphasized. On the Thursday prior to the field trip the program coordinator visited the classroom and laid a foundation for the trip.

On the day of the trip the program coordinator returned to the school with one or more field trip assistants and boarded the bus with the class. En route to the field trip site, points of interest in the community environment were discussed which related to the grade-level theme. Upon arrival at the resource site the class was divided into smaller groups, each with its own trail leader. While in the field the resource site was interpreted in a manner that related to the theme and understandings for the particular grade. In other words, each grade level, using its own site, had an entirely different field trip experience. On the return bus trip the field trip experiences were highlighted and the entire trip reviewed. In order to continue the learning experience a teachers' kit was prepared for each grade level and given to the teacher one week prior to the orientation. This kit contained written material on the grade level theme and understandings, several publications pertinent to the teacher's grade level, and suggested follow-up activities. In case of inclement weather field trips were rescheduled for the Friday of the same week.

The kindergarten program was scheduled for a two-week period immediately following the fall program for the other elementary classes. The program consisted of a 20-25 minute presentation by the program coordinator on "how plants and animals prepare for winter and live during this period of time." Two one-half hour appointments were scheduled together so that two separate talks could be scheduled for two different kindergarten classes in the same school in a one-hour period of time. In several cases four presentations were given in one school in a single day (a presentation to each of the morning kindergarten classes and a presentation to each of the afternoon kindergarten classes.) Arrangements were made to handle all of the kindergarten classes during this two-week period of time. Since the program coordinator was not able to schedule another session with the kindergarten classes, a third chart was developed on "plants and animals of the spring months," and a presentation using the spring chart was given to all kindergarten teachers. Arrangements were then made in the spring months to send the fall, winter, and spring charts around to each school, so that the kindergarten teachers could make the spring presentation to their classes and could review the fall presentation made by the program coordinator.

CHAPTER III

DEVELOPMENT OF THE SECONDARY PHASE OF THE OUTDOOR AND CONSERVATION EDUCATION PROGRAM AND INTEGRATING IT INTO THE EXISTING CURRICULUM OF THE ANN ARBOR PUBLIC SCHOOL SYSTEM (7-12)

Development of the Secondary Phase of the Program

The First Major Stage

The first major stage in the development of the secondary phase of the Outdoor and Conservation Education Program in the Ann Arbor Public Schools was for the program coordinator to become familiar with the secondary science and social studies curriculum guides and textbooks and with the scope and sequence of each secondary science and social studies courses. To determine this information the program coordinator examined the course guides and textbooks of each secondary science and social studies course.

The Second Major Stage

The second major stage was for the program coordinator to consider important conservation topics that might be integrated into particular science and social studies courses. After a thorough study of each secondary science and social studies course and a re-examination of the guiding principles of the Outdoor and Conservation Education Program, conservation topics for each secondary science and social studies course was formulated by the program coordinator.

The Third Major Stage

The third major stage for the program coordinator was to meet with the secondary science executive committee, composed of the science coordinator, and secondary building representatives, to discuss ways that the program coordinator could be of greatest assistance to the science department. The executive committee recommended that the program coordinator meet with the secondary science classroom teachers to describe briefly conservation topics related to the existing curriculum that the the teachers might like to have assistance in integrating into their courses.

The Fourth Major Stage

The fourth major stage was for the program coordinator to meet with the science teachers of the junior and senior high schools to discuss ways that the program coordinator could serve the secondary science department. At this meeting the program coordinator reviewed the elementary phase of the program and then discussed conservation topics that would expand and extend the conservation understandings developed in the elementary program and that were closely related to the subject matter of the secondary science program. The program coordinator then

asked the teachers to meet in groups according to subject and to list conservation topics that they would like to have assistance in integrating into their courses. They then listed the following conservation topics that they would like to have integrated into particular courses:

1. General Science (seventh)
   a. The effect of fire on the environment and its uses in resource management.
   b. Integrating conservation into the Tappan Science Camp Program.
2. General Science (eighth).
   a. Population increase and its impact upon natural resources.
   b. The management of the white-tailed deer.
3. Biology (ninth, tenth, eleventh, twelfth).
   a. The effect of pollution on stream biology.
   b. Pests, pesticides, and people.
   c. The sea lamprey program.
   d. The forest community
   e. A laboratory exercise on the feeding habits of owls.
4. Senior Science (eleventh, twelfth).
   a. The effect of pollution on stream biology.
   b. Pests, pesticides, and people.
   c. The sea lamprey program.
   d. The forest community.

The science teachers stated that the program coordinator could be of greatest assistance if he prepared, mimeographed, and distributed to them subject material on each of the conservation topics they requested. They also requested that visual aid material be prepared on each of the selected conservation topics to enhance classroon presentations.

The Fifth Major Stage

The fifth major stage was for the program coordinator to meet with the social studies coordinator to discuss ways of integrating the Conservation Education Program into the secondary social studies curriculum. The social studies coordinator suggested that the program coordinator meet with the Secondary Social Studies Executive Committee to discuss ways that the program coordinator might be of greatest service to the social studies department.

The Sixth Major Stage

The sixth major stage was for the program coordinator to meet with the secondary social studies executive committee, composed of the social studies coordinator and building representatives, to review the elementary phase of the program and discuss conservation topics that would expand and extend conservation understandings developed in the elementary program and which were closely related to the subject matter of the secondary social studies program. The program coordinator then asked the building representative to list conservation topics that they would like to have assistance in integrating into their courses. They then listed the following conservation topics that <u>they</u> would like to have integrated into particular courses:

1. Unified Studies (seventh).
   a. Schistosomiasis: Problems involved in controlling a public health disease that is interwoven into a country's religious, economic, political, educational, and social system.
2. American History (eighth, eleventh, twelfth).
   a. The impact of the Theodore Roosevelt administration on conservation.
   b. The conservation movement in the United States.
3. American Government (ninth, eleventh, twelfth).
   a. The Huron River Watershed Intergovernmental Committee: an organization to study and recommend solutions to water problems within the Huron River Basin.
   b. Controlling water pollution: intergovernmental relations.
4. Economics (eleventh, twelfth).
   a. Population increase and its impact upon natural resources.
   b. Natural gas: a resource in world perspective.
5. Social Problems (twelfth).
   a. Demand for outdoor recreation.
   b. Sleeping Bear Dunes.

The Social Studies Executive Committee stated the program coordinator could be of greatest assistance to them if he <u>prepared, mimeographed</u>, and <u>distributed</u> to the social studies teachers, subject material on each of the conservation topics. They also requested to have <u>visual aid material</u> prepared on each of the selected conservation topics to enhance classroom presentations.

The Seventh Major Stage

The seventh major stage was to prepare, mimeograph, and distribute to the science and social studies teachers subject material on each of the conservation topics they requested. After preparing each unit, the program coordinator had one or more authorities in the particular field in which the unit was prepared check the material for accuracy and clarity before mimeographing the material.

The Eighth Major Stage

The eighth major stage was to develop a series of Kodachrome slides that could be used by the classroom teacher or program coordinator to enhance the classroom presentation of each conservation topic. To obtain the necessary slides, the program coordinator received permission to duplicate personal slides of authorities in the various fields. A set of approximately 25 slides were prepared on each of the conservation topics being integrated into the secondary program.

The Ninth Major Stage

The ninth major stage in the development of the secondary phase of the Outdoor and Conservation Education Program was to provide an inservice training program for the secondary science and social studies teachers. This training program was in the form of classroom and field trip presentations and in the preparation and distribution of additional conservation material.

Operation Of The Secondary Phase Of The Program

In the operation of the secondary phase of the program, the secondary science and social studies teachers requested conservation topics that they would like to have assistance in integrating into their courses. The program coordinator then prepared, mimeographed, and distributed to the classroom teacher subject material on the requested topics. Visual aids were then prepared to enhance the classroom presentation of the conservation topics.

The program coordinator was available throughout the school year to assist the secondary science and social studies teachers by giving classroom presentations on any of the conservation topics they requested, to prepare additional resource material for their usage, or to assist them in other related ways. Although the program coordinator was available to assist any secondary teacher at any time during the school year, his time was primarily devoted to the secondary program during the winter months.

CHAPTER IV

PARTICIPATION IN THE OUTDOOR AND CONSERVATION EDUCATION PROGRAM

Class Participation in the Elementary Phase of the Program

The program for the kindergarten classes consists of a 20-25 minute presentation on how plants and animals prepare for the winter months and live during this period of time. A total of 55 classes, which were all of the kindergarten classes in the school system, were involved in the program during the first year of operation.

The presentation of the program for grades one through six consists of three separate phases: orientation, field trip, and follow-up. A total of 166 classes, from all elementary classes, participated in this phase of the program.

The total number of elementary classes in the Ann Arbor Public School System is 302. During the first year of operation, 221 of these classes, or 73 percent of all elementary classes, were involved in the program.

The program was established to accommodate two-thirds of all elementary classes in the school system, or approximately 200 of the 300 elementary classes. It was thought that this would meet the demand for field trips, since the program was entirely voluntary and the students paid their bus transportation fee. When all field trip appointments were reserved, a waiting list was formed. If no field trips were rescheduled during the week, classes on the waiting list were scheduled on Fridays. During the first year of operation only three classes had to be rescheduled due to rainy weather.

In addition to the regular elementary program, the program coordinator was able to provide a field trip or a special presentation for all mentally retarded and emotionally disturbed classes.

The total number of elementary students involved in the Outdoor and Conservation Education Program during the first year of operation was 5,763 students, or 74 percent of all elementary students in the Ann Arbor Public School System.

Table 2 indicates the participation in the elementary phase of the program by schools. Table 3 indicates the participation in the elementary phase of the program by grade levels.

Table. -- Participation by schools in the elementary phase of the program during the first year of operation.

Elementary School[a]	CLASSES Total No.	Total Participating	Pct. Participating	No. of Participating Classes K	1	2	3	4	5	6
Allen	12	8	67	3	2	2	0	1	0	0
Angell	18	10	56	2	1	2	1	2	0	2
Bach	14	9	64	2	1	0	0	2	2	2
Burns Park	28	25	89	4	4	4	3	2	4	4
Carpenter	15	8	53	3	2	0	2	0	0	1
Dicken	24	15	62	3	4	2	1	3	2	0
Dixboro	4	2	50	1	0	0	0	0	0.5	0.5
Eberwhite	21	14	66	4	2	2	1	2	1	2
Haisley (Fritz)	28	21	75	6	3	4	0	3	2	3
Jones	9	9	100	2	2	1	1	1	1	1
Lakewood	9	8	89	2	1.5	1.5	1	1	1	0
Mack	21	18	86	4	2	2	2	3	2	3
Mitchell(Pittsf)	19	18	95	4	3	2	3	2	2	2
Northside	20	14	70	4	3	2	1	2	1	1
Pattengill	17	14	82	3	1	3	1	2	2	2
Perry	6	4	67	2	0	0	0	0.5	1	0.5
Stone	9	6	67	1	0	1	2	0	1	1
Wines	27	18	67	5	4	3	1	1	3	1
Totals	302	221	73	55	35.5	31.5	20	27.5	25.5	26

[a]The schools listed within parentheses are feeder schools.

Table 3. -- Participation by grade level in the elementary phase of the program during the first year of operation.

	Total No. of Classes	Total No. of Partic-ipating Classes	Percent
Kindergarten	56	55	98
First	47	35.5	78
Second	44.5	31.5	70
Third	43.5	20	46[a]
Fourth	39	27.5	70
Fifth	36.5	25.5	70
Sixth	35.5	25.5	73
Totals	302	221	73

[a]Tours could not be scheduled in the vertebrate museum after April 15 in order to give other school systems an opportunity to use the museum facilities during the spring months.

In addition to the regular elementary phase of the Outdoor and Conservation Education Program, the program coordinator was requested to make the following presentations:

1. Seven classroom presentations on the importance of plankton.
2. Two classroom presentations on sea resources.
3. Two classroom presentations on Michigan geology.
4. Eleven field trip presentations on the land economy of southeastern Michigan.
5. Three classroom presentations on Michigan birds.
6. Four classroom presentations on the feeding habits of owls.
7. Three classroom presentations on Michigan mammals.
8. One classroom presentation on making paper from wood pulp.
9. Eight classroom presentations on the forest community.
10. One classroom presentation on desert life.
11. Two classroom presentations on the Hopewellian Indian culture.
12. Two assembly presentations on plants and animals during the winter months.
13. Thirty-two assembly presentations on the National Audubon Society documentary film, "The Bald Eagle, Our National Bird."

Class Participation in the Secondary Phase of the Program

The secondary science and social studies teachers requested conservation topics they would like to have assistance in integrating into their courses. The science and social studies teachers thought the conservation topics could best be used if information on each of the topics could be prepared, mimeographed and distributed to the classroom teacher. They further requested that the conservation coordinator be available to assist in the presentation of conservation topics, to prepare additional resource material for their usage, or to assist them in other ways.

The following conservation topics were prepared, mimeographed and distributed to the secondary science and social studies teachers:

Secondary Science

1. General Science (seventh)
   a. The effect of fire on the environment and its uses in resource management (19 pages)
      Visual aids: a set of 35 Kodachrome slides

2. General Science (eighth)
   a. Population increase and its impact upon natural resources (16 pages)
      Visual aids: a set of 25 Kodachrome slides
   b. The management of the white-tailed deer (10 pages)
      Visual aids: a set of 20 Kodachrome slides

3. Biology (ninth, tenth, eleventh, and twelfth)
   a. The effect of pollution on stream biology (13 pages)
      Visual aids: a set of 27 Kodachrome slides
   b. Pests, pesticides, and people (22 pages)
      Visual aids: a set of 32 Kodachrome slides
   c. The sea lamprey program (12 pages)
      Visual aids: a set of 26 Kodachrome slides
   d. The forest community (14 pages)
      Visual aids: a set of 26 Kodachrome slides
   e. The bounty problem (16 pages)
      Visual aids: a set of slides, skins and charts
   f. The feeding habits of owls (7 pages)
      Laboratory exercise: owl pellet analysis

4. Senior Science and Conservation (eleventh and twelfth)
   a. The effect of pollution on stream biology (13 pages)
      Visual aids: a set of 27 Kodachrome slides
   b. Pests, pesticides, and people (22 pages)
      Visual aids: a set of 32 Kodachrome slides
   c. The sea lamprey program (12 pages)
      Visual aids: a set of 26 Kodachrome slides
   d. The forest community (14 pages)
      Visual aids: a set of 26 Kodachrome slides
   e. The air pollution problem (10 pages)
      Visual aids: a set of 20 Kodachrome slides

f. The bounty problem (16 pages)
   Visual aids: a set of slides, skins and charts
g. The feeding habits of owls (7 pages)
   Visual aids: a laboratory study of owl pellets

Secondary Social Studies

1. Unified Studies (seventh)
   a. Schistosomiasis: Problems involved in controlling a public health disease that is interwoven into a country's religious, economic, educational, political and social system (15 pages).
      Visual aids: a set of 32 Kodachrome slides

2. American History (eighth and eleventh)
   a. The impact of the Theodore Roosevelt administration on conservation (14 pages)
      Visual aids: a set of 25 Kodachrome slides
   b. The conservation movement in the United States (21 pages)

3. American Government (ninth and eleventh)
   a. The Huron River Watershed Intergovernmental Committee: an organization to study and recommend solutions to water problems within the Huron River Basin (7 pages).
      Visual aids: a set of 30 Kodachrome slides
   b. Controlling water pollution: intergovernmental relations (37 pages)
   c. The bounty problem: Efforts will be renewed during the 1963 legislative session to end Michigan's bounty system (16 pages).
      Visual aids: a set of slides and charts

4. Economics (tenth and eleventh)
   a. Population increase and its impact upon natural resources (16 pages)
      Visual aids: a set of 25 Kodachrome slides
   b. Natural gas: a resource in world perspective (13 pages)

5. Social Problems (twelfth)
   a. Demand for outdoor recreation: a summary of a survey just completed of our country's present and likely demand in outdoor recreation over the next forty years -- ORRRC Report (10 pages).
      Visual aids: a set of 25 Kodachrome slides
   b. Sleeping Bear Dunes: a proposal to establish Sleeping Bear Dunes as a national recreation area.
      Visual aids: a set of 20 Kodachrome slides

In addition to the material prepared for the secondary science and social studies teachers, the program coordinator was requested to make the following presentations:

1. Thirty-three classroom presentations on the effect of fire on the environment and its uses in resource management (seventh-grade General Science).

2. Fifteen classroom presentations on the problems of controlling a public health disease that is interwoven into a country's religious, economic, political, educational and social system (seventh-grade Unified Studies).

3. Four field trip presentations on the forest community (seventh-grade General Science).

4. Two field exercises on schoolground plantings (mentally retarded program).

5. Five classroom presentations on the conservation of mineral resources (eighth-grade General Science).

6. One school assembly and eleven classroom presentations on the impact of the Theodore Roosevelt administration on conservation (School assembly and American History).

7. Ten classroom presentations on the documentary motion picture, "The Bald Eagle, Our National Bird" (seventh and eighth-grade General Science and Biology).

8. Seven classroom presentations on the Huron River Watershed Intergovernmental Committee (American Government).

9. Twelve classroom presentations on pests, pesticides and people (Biology, Senior Science and Conservation).

10. Two classroom presentations on the bounty problem (American Government).

11. Two classroom presentations on managing land for game animals in southeastern Michigan (Biology).

12. Two classroom presentations on plants and animals during the winter months (mentally retarded program).

13. Fourteen classroom presentations on the sea lamprey (Biology, Senior Science and Conservation).

14. One classroom presentation on the impact of population growth on resource demand (Economics).

15. One field trip presentation pnesentation on land management practices in Washtenaw County (Biology).

16. Three classroom presentations on the effect of pollution on stream biology (Biology and Conservation).

17. Two field trip presentations on the forest and bog community (mentally retarded program).

18. One classroom presentation on the forest community (Conservation).

19. One classroom presentation on the conservation movement in the United States (American History).

20. One classroom presentation on air pollution (Conservation).

21. One classroom presentation on the demand for outdoor recreation (Social Problems).

22. One classroom presentation on the feeding habits of owls (Conservation).

23. One classroom presentation on water problems (Conservation).

In addition to the regular secondary phase of the Outdoor and Conservation Education Program, the program coordinator was requested to assist secondary science and social studies teachers in the following extra-curricular activities:

1. One indoor presentation on the Michigan Hawk and Owl Law (Biology Club).

2. One indoor presentation on the formation, scientific value, and economic importance of bogs (Science Club).

3. One field trip presentation on managing land for game animals; and on the formation of bogs (Biology Club).

4. One field trip presentation on small woodlot management practices in southeastern Michigan (Biology Club).

5. One indoor presentation on the impact of the Theodore Roosevelt administration on conservation (American History Club).

6. One field exercise on hydrographic mapping of a lake to be used in a fish management program (Biology students).

7. One field exercise on collecting physical-chemical data on a lake to be used in a fish management program (Biology students).

8. One field exercise on collecting biological data on a lake to be used in a fish management program (Biology students).

9. One indoor presentation on insecticides (Biology Club).

In-service Training Program for Teachers

One of the most important aspects of the Outdoor and Conservation Education Program is in-service training for teachers. Due to the scope of the program the program coordinator's personal contact with each class is limited. Therefore, it was vitally important in the establishment of the program and in its continuation to provide a comprehensive in-service training program for teachers. It was felt that the training program should be directed at helping the teacher increase his understandings, interest, awareness and teaching skills in conservation. This would help the teacher prepare the learner for the field trip experience and continue the learning experience at the completion of the field trip.

The in-service training program for teachers is multipronged, so that the teachers will receive training throughout the school year. During the first year and a half of operation, the teachers of the Ann Arbor Public Schools were involved in the following training program:

1. Grade-level presentations

    a. Kindergarten: indoor presentation on the organization and content of the Outdoor and Conservation Education Program (all kindergarten teachers).

    b. First grade: indoor presentation on the organization and content of the Outdoor and Conservation Education Program(all first-grade teachers).

    c. First grade: field trip at Eberwhite Woods to study the grade-level theme and understandings (voluntary program).

    d. Second grade: outdoor presentation at the Karmann Nature Center on the organization and content of the Outdoor and Conservation Education Program (all second-grade teachers).

    e. Second grade: field trip at the Karmann Nature Center to study the grade-level theme and understandings (voluntary program).

    f. Third grade: field trip at Eberwhite Woods to study the grade-level theme and understandings (voluntary program).

    g. Fourth grade: outdoor presentation at the Karmann Nature on the organization and content of the Outdoor and Conservation Education Program (all fourth-grade teachers).

    h. Fourth grade: field trip at the Karmann Nature Center to study the grade-level theme and understandings (voluntary program).

i. Fifth grade: outdoor presentation at the Wines School Woods on the organization and content of the Outdoor and Conservation Education Program (all fifth-grade teachers).

j. Fifth grade: special field trip at the Wilson Preserve to study the grade-level theme and understandings (voluntary program).

k. Sixth grade: outdoor presentation at the Deppmann Farm on the organization and content of the Outdoor and Conservation Education Program (voluntary program).

l. Sixth grade: special field trip at the Deppmann Farm to study the grade level theme and understandings (all sixth-grade teachers).

m. Secondary science: indoor presentation on the organization and content of the Outdoor and Conservation Education Program (all secondary science teachers).

n. Secondary social studies: indoor presentation on the organization and content of the Outdoor and Conservation Education Program (social studies building representatives of each secondary school).

2. Interschool presentations

a. Indoor illustrated presentation on the ways of extending classroom activities to the school grounds (staff study day; voluntary; K-6).

b. Indoor illustrated presentation on ways of enhancing field trips (staff study day; voluntary; K-6).

c. Indoor illustrated presentation on reading the Ann Arbor landscape (staff study day; voluntary; K-6).

d. Indoor illustrated presentation on environmental conservation (staff study day; voluntary; 3-6).

e. Indoor illustrated presentation on the forest community (Michigan Education Association; voluntary; K-12).

f. Indoor illustrated presentation on Michigan geology (in-service training presentation; voluntary; 3-6).

g. Indoor illustrated presentation on ways of using freshwater communities to enhance classroom presentations (Michigan Education Association; voluntary; K-12).

h. Indoor illustrated presentation on weather and climate (in-service training presentation; voluntary; 3-6).

i. Field trip on the forest community in the spring (in-service training presentation; voluntary; K-12).

j. Field trip on the land economy of southeastern Michigan and fossil-collecting (in-service training presentation; voluntary; k-12).

3. School building presentations

a. Field trip presentations on ways of using Eberwhite Woods to enhance the elementary curriculum (Eberwhite, Bach and Dicken Schools; voluntary, K-6).

b. Field trip presentation on ways of using Lakewood Woods to enhance the elementary curriculum (Lakewood School; all school personnel; K-6).

c. Field trip presentation on ways of using Mitchell Woods to enhance the elementary curriculum (Mitchell School; voluntary; K-6).

d. Field trip presentation on ways of using Wines School Woods to enhance the elementary curriculum (Wines School; voluntary K-6).

e. Field trip presentation on ways of using Dhu Varren Woods to enhance the mentally retarded program (Dhu Varren School; all school personnel; group "B" retarded program).

f. Field trip presentation on ways of using Sullivan School's property to enhance the mentally retarded program (Sullivan School; voluntary; group "B" retarded program).

g. Indoor illustrated presentation on classroom and school ground activities for the mentally retarded (Sullivan, Jones and Forsythe Schools; voluntary; group "A" and "B" retarded programs).

h. Indoor illustrated presentation on the organization and content of the Outdoor and Conservation Education Program (Eberwhite School; all school personnel; K-6).

i. Indoor illustrated presentation on the organization and content of the Outdoor and Conservation Education Program (Pittsfield and Mitchell Schools; all school personnel; K-6).

j. Indoor illustrated presentation on Schistosomiasis in Egypt (Tappan School; Unified Studies Teachers).

k. Field trip presentation at the Island Lake Recreation Area (Tappan School; science camp personnel).

l. Indoor presentation on a proposed conservation outdoor laboratory (Ann Arbor High School science teachers).

4. Assisted individual teachers with conservation projects at the following schools:

   a. Establishing a school nature trail (Abbot and Jones).
   b. Owl pellet study (Burns Park, Mack and Ann Arbor High).
   c. Making paper from wood pulp (Perry and Forsythe).
   d. Evergreen planting beds (Haisley, Sullivan and Mack).
   e. Fish Management Program: hydrographic mapping; physical and chemical analysis of water; biological studies (Tappan, Forsythe and Slauson).

5. Provided individual teachers with requested conservation material at the following schools:

   a. Sleeping Bear Dunes proposal (Tappan and Ann Arbor High).
   b. Huron River Watershed (Eberwhite, Haisley, Forsythe and Ann Arbor High).
   c. Air pollution (Ann Arbor High).
   d. Conservation of mineral resources (Forsythe and Tappan).
   e. The Michigan bounty problem (Forsythe).

6. Assisted individual teachers with curriculum planning at the following schools:

   a. Tappan
   b. Ann Arbor High

7. Material prepared and mimeographed on particular topics:

   a. Outstanding state parks, recreation areas, sanctuaries, museums and scenic areas within 70 miles of Ann Arbor (8 pp.). Circulated to all new teachers during orientation week.
   b. Ways of using Eberwhite Woods to enrich the elementary curriculum (7 pp.). Circulated to all Eberwhite, Bach and Dicken School teachers.
   c. Ways of using Wines Woods to enrich the elementary curriculum (9 pp.). Circulated to all Wines School teachers.
   d. Ways of using Lakewood Woods to enrich the elementary curriculum (8 pp.). Circulated to all Lakewood School teachers.
   e. Ways of using Mary D. Mitchell Woods to enrich the elementary curriculum (9 pp.). Circulated to all Mary D. Mitchell School teachers.

f. The art of making paper (3 pp.). Circulated to all fourth-grade teachers.
g. Suggested activities for the mentally retarded (11 pp.). Circulated to all third-grade teachers.
h. Insects in relation to man (4 pp.). Circulated to all secondary science teachers.
i. Wetwood disease (5 pp.). Circulated to all secondary science teachers.
j. Oak wilt disease (3 pp.). Circulated to all secondary science teachers.
k. The Michigan bounty problem (11 pp.). Circulated to all secondary social studies and science teachers.
l. Owl pellet study (7 pp.). Circulated to all fifth-grade teachers and secondary science teachers.
m. Scat and pellet identification sheet (2 pp.). Circulated to all secondary science teachers.
n. Brief geological history of southeastern Michigan (5 pp.). Circulated to all fourth and sixth-grade teachers and secondary science teachers.
o. Weather and climate (19 pp.). Circulated to all third and sixth-grade teachers and secondary general science teachers.
p. Rocks and minerals (15 pp.). Circulated to all fourth and sixth-grade teachers and secondary general science teachers.
q. The study of fresh-water communities (17 pp.). Circulated to all sixth-grade teachers.
r. The forest community (8 pp.). Circulated to all fourth-grade teachers.
s. Considerations for enhancing field trips (2 pp.). Circulated to all elementary teachers.
t. Ways of extending classroom activities to the out-of-doors (5 pp.). Circulated to all elementary teachers.
u. A check list of considerations for trail leadership (6 pp.). Circulated to all elementary teachers.

Miscellaneous Services Stemming from the Program

Although the major emphasis of this program is directed at the students and teachers of the Ann Arbor Public School System, the program coordinator accepted requests to make presentations to community organizations in order to help inform and arouse the interest of local citizens to their responsibility of being informed and taking an active interest in local, state and national resource issues. The program coordinator also welcomed the opportunity to discuss the total program to parent-teacher organizations so that the parents will be better informed as to the nature and purpose of the program.

The program coordinator also accepted requests to make presentations to organizations and school systems of neighboring communities, concerning the organization and operation of the Outdoor and Conservation Education Program, in order to assist teachers and administrators who are considering a total conservation program for their school systems.

During the first year and one-half of operation, presentations were made to the following organizations:

1. Presentations to Parent-Teachers Organizations of the Ann Arbor Public Schools (13 presentations).
2. Presentations to schools and organizations from other communities: (22 presentations).
3. Presentations to youth organizations (7 presentations).
4. Presentations to state organizations (8 presentations).
5. Presentations to miscellaneous organizations (18 presentations).

CHAPTER V

EVALUATION OF THE OUTDOOR AND CONSERVATION EDUCATION PROGRAM

An evaluation of the Outdoor and Conservation Education Program was administered at the end of the first full year of operation of the elementary and secondary phases of the program. The evaluation of the program was in two parts. The first part was an open-end qualitative evaluation in which administrators (superintendent of schools, assistant superintendent in charge of curriculum, social studies coordinator, science coordinator, secondary principals and elementary principals) and classroom teachers (secondary social studies teachers, secondary science teachers and elementary teachers) were asked to recall and record by brief statements what features of the Outdoor and Conservation Education Program were helpful, in their opinion, in approaching the instructional goals of the Ann Arbor School System. The second phase of the evaluation was a quantitative evaluation in which secondary science and social studies teachers and elementary teachers were asked to respond to a series of questions concerning the degree of helpfulness of certain aspects of the program, by circling one of ten points on a nongraded scale. They were also asked to respond briefly to several additional questions. One question was directed to new kinds of attitudes and interests observed in students as a result of the program. A second question sought information concerning ways that the program helped the individual classroom teacher. A third question requested information concerning ways of improving the conservation program. The quantitative evaluations were not sent to the classroom teachers until the program coordinator had received all qualitative evaluations.

Analysis of the qualitative evaluation revealed that the Outdoor and Conservation Education Program was very helpful in:

1. Approaching the instructional goals of the Ann Arbor Public School System.
2. Helping to develop desirable interests, attitudes and appreciations at all grade levels.
3. Helping to develop desirable conservation understandings and concepts at all grade levels.
4. Helping teachers to be more effective in the presentation of conservation material.

A comparison made with the list of Important Understandings of Conservation Education, published by the Michigan Department of Public Instruction in cooperation with the Michigan Department of Conservation, shows that of 212 understandings listed by the Department of Public Instruction, 92 were included in the elementary science and social studies curriculum guides of the Ann Arbor Public Schools and 172 were incorporated into the

Outdoor and Conservation Education Program. Of the 172 understandings, 133 were incorporated into the elementary program and 138 into the secondary program.

Analysis of the quantitative evaluation revealed that:

1. Elementary teachers:

   a. Rated the program high in approaching their instructional goals.
   b. Rated the program high in the degree of helpfulness that the outdoor and conservation education written material was in approaching their instructional goals.
   c. Rated the program high in the degree of helpfulness the orientation period was in preparing their students for the field trip.
   d. Rated the program high in the degree of helpfulness the presentation on the school bus was in preparing their students for the field trip.
   e. Rated the program high in the degree of helpfulness the continuing activities were in extending the interest and attitude of their students.
   f. The kindergarten teachers rated the program high in establishing a "friendly" relationship between the child and the living world.
   g. The first-grade teachers rated the program high in increasing the child's awareness of his environment.
   h. The second-grade teachers rated the program high in increasing the child's understanding of the interrelationship between plants, animals and soil.
   i. The third-grade teachers rated the program high in increasing the child's understanding of the interrelationship between aquatic plants and animals and their nonliving environment.
   j. The fourth-grade teachers rated the program high in increasing the child's understanding and appreciation of the interrelationship and interdependence between plants, animals, soil and water.
   k. The fifth-grade teachers rated the program high in increasing the student's understadning of man's impact on the environment.
   l. The sixth-grade teachers rated the program high in increasing the student's understanding of how land management practices in a watershed influence the welfare of all people living in the watershed.

2. Secondary science and social studies teachers:

   a. Rated the program high in approaching their instructional goals.
   b. Rated the program high in the degree of helpfulness the conservation education written material was in approaching the instructional goals of their course.
   c. Rated the program high in the degree of helpfulness the program coordinator's classroom presentation was in approaching their instructional goals.

CHAPTER VI

IMPLEMENTING THE OUTDOOR AND CONSERVATION EDUCATION PROGRAM INTO OTHER SCHOOL SYSTEMS

I feel that even though the Outdoor and Conservation Education Program was developed for the Ann Arbor Public School System, the program can be successfully integrated into other school systems in the country with slight modifications to meet the prevailing conditions unique to each school system and municipality.

Some of the ways that the Outdoor and Conservation Education Program of the Ann Arbor Public Schools might assist conservation program coordinators or administrators interested in developing a similar program in other cities are:

1. Consideration of the employment of a program coordinator to operate the program. If the school system is noticeably larger than the Ann Arbor Public School System, consideration should be given to employ a second program coordinator on a part-time or a full-time basis, depending on the size of the school system. If two program coordinators were employed by a school system, then the responsibility of each could be divided according to their ability. However, since the demand for elementary field trips would probably be too great for just one program coordinator to handle, it would be best if both coordinators could operate from kindergarten through the twelfth grade. Each might serve a particular geographical area within the city.

2. Consideration of the guiding principles formulated and incorporated into this program. The following modifications might be considered if the program were being developed for a school system that is largely rural or if a science or social studies curriculum does not exist:

   a. If the school system were largely rural, a greater emphasis might be placed on vocational skills.

   b. If a science and social studies curriculum has not been developed for the school system, the program coordinator would be in a position to work closely with the administrator most responsible to the curriculum in developing the conservation program.

3. Consideration of the sequential steps used in the development of the elementary phase of the Outdoor and Conservation Education Program.

4. Consideration of the sequential steps used in the development of the secondary phase of the Outdoor and Conservation Education Program.

5. Consideration of the nature and extent of the in-service training program for teachers.

6. Consideration of the involvement of local, state and national organizations in the operation of the program. In the Outdoor and Conservation Education Program we received assistance from: Washtenaw Audubon Society; Izaak Walton League, Superior Chapter; Superior Civic Association; Dexter Lakes Club; Ann Arbor Ornithological Society; Federated Women's Club of America, Washtenaw Chapter; and local agents of the Michigan Department of Conservation and the Soil Conservation Service of America.

7. Consideration of the use of community citizens in the operation of the program. In the Outdoor and Conservation Education Program we used community citizens to serve as field trip guides, development of orientation posters, trail blazing, and other miscellaneous services.

8. Consideration of the use of private land as resource sites in the program[1]. In the Outdoor and Conservation Education Program we made extensive use of five private land sites.

Perhaps one factor that could prevent a school system from developing an Outdoor and Conservation Education Program is the procurement of an adequately trained and motivated person to develop and operate the program. However, if there is a demand for conservation program coordinators, I think that candidates seeking this type of employment could be adequately trained in a master's degree program, such as the one offered in the Department of Conservation, School of Natural Resources, University of Michigan. However, if the candidate has had no training in education, then the candidate would need to obtain a teaching certificate and would probably need several years of classroom teaching experience before being employed as a program coordinator for a school system.

A school system seeking to employ a conservation program coordinator could interview candidates who have been trained for such a position or could send one of their present employees to an institution, such as the University of Michigan, to receive the proper academic training. Prospective conservation program coordinators receiving their training at the University of Michigan would have the opportunity of working in Ann Arbor's Outdoor and Conservation Education Program.

[1]When considering resource sites, strong consideration should first be given to the use of local school sites. When these sites will not serve all the needs of the program, then other resource sites could then be incorporated into the program.

Some of the special qualifications that a conservation program coordinator should possess in order to develop and operate an Outdoor and Conservation Education Program for a school system (K-12) are:

1. Broad educational background with special training in education, conservation and the natural and social sciences.

2. Ability to operate at all three levels of the school curriculum.

3. Ability to operate in both science and social studies curriculum areas.

4. Ability to teach both in the classroom and in the field.

5. Ability to design and operate an in-service training program for teachers.

6. A responsible individual who has both administrative and teaching skills.

7. Dedication to outdoor and conservation education.

I strongly believe that if there were a demand for conservation program coordinators in our country, able students with a genuine interest and dedication in conservation education would be attracted to an institution offering the proper training. At the present time many prospective conservation education students drift into other fields of interest due to the low demand for positions in the field of conservation education.

CHAPTER VII

SUMMARY AND CONCLUSIONS

One of the major aims of this book is to show chronologically the process by which a conservation education program was developed and integrated into the Ann Arbor Public School System (K-12).

Even though the conservation education program described in this booklet was developed for the Ann Arbor Public Schools, the program can be successfully integrated into other school systems in the country with slight modifications to meet the prevailing conditions unique to each school system and municipality.

To develop a Conservation Education Program for the Ann Arbor Public School System (K-12), the following procedures were followed:

1. Designing the program
   a. Established a set of guiding principles that should be included in a conservation education program.
   b. Examined the science and social studies program and identified conservation elements in the existing curriculum.
   c. Developed themes and understandings for each elementary grade level that would link the subject matter of the existing science and social studies curriculum and would provide the desired continuity and progression in the program.
   d. Selected conservation topics to be integrated into secondary science and social studies courses.
   e. Developed an organizational structure which would facilitate the integration of conservation understandings into the existing framework of the Ann Arbor Public Schools.
2. Preparation of materials
   a. Prepared content material on the theme and understandings developed for each elementary grade level.
   b. Prepared content material on each of the conservation topics selected by secondary science and social studies teachers to be integrated into their courses.
   c. Developed charts for each elementary grade level to help prepare the learner for the field trip experience.
   d. Developed a series of Kodachrome slides to enhance the classroom presentation of each conservation topic being integrated into the secondary science and social studies program.
3. Preparation of teachers
   a. Provided in-service training workshops for elementary and secondary teachers.
   b. Provided elementary and secondary teachers with information on current conservation issues, in addition to the substantive material mentioned in the preparation of materials.
4. Evaluation of the program
   a. An open-end qualitative evaluation was sent to administrators (superintendent of schools, assistant superintendent in charge of curriculum, social studies coordinator, science coordinator and secondary and elementary teachers)

on June 1, 1962. The administrators and classroom teachers were asked to recall and record by brief statements what features of the conservation program were helpful, in their opinion, in approaching the instructional goals of the Ann Arbor Public School System.

b. A quantitative evaluation was sent to teachers (secondary social studies teachers, secondary science teachers, and elementary teachers), after I had received the qualitative evaluation, asking them to respond to a series of questions by circling one of ten points on a non-graded scale. They were also asked to respond briefly to several additional questions. One question was directed to new kinds of attitudes and interests observed in students as a result of this program. A second question requested information concerning ways of improving the conservation program.

In the operation of the elementary phase of the program, every elementary teacher in the Ann Arbor Public Schools had an opportunity to make an appointment to have her class guided through one of several resource areas in our community during the fall or spring months. The presentation of the program consisted of three separate phases: orientation, field trip and follow-up. Prior to the classroom orientation, contact was made between the teacher and program coordinator to determine what understandings pertaining to the field trip theme had already been discussed with the class, and what understandings the teacher would like to have especially emphasized. On the Thursday prior to the field trip the program coordinator visited the school and laid a foundation for the trip. On the day of the trip the program coordinator returned to the school with one or more field trip assistants and boarded the bus with the class. En route to the field trip site, points of interest in the community environment were discussed which related to the grade-level theme. Upon arrival at the resource site the class was divided into smaller groups, each with its own trail leader. While in the field, the resource site was interpreted in a manner that related to the theme and understandings for the grade. In other words, each grade level, using its own site, had an entirely different field trip experience. On the return bus trip the field trip experiences were highlighted and the entire trip reviewed. In order to continue the learning experience a teachers' kit was prepared for each grade level and given to the teacher one week prior to the orientation. This kit contained written material on the grade-level theme and understandings, several publications pertinent to the teacher's grade level, and suggested follow-up activities. In case of inclement weather, field trips were rescheduled for the Friday of the same week.

The program for the kindergarten classes consisted of a 20-25 minute presentation on how plants and animals prepare for the winter months and live during this period of time. A total of 55 classes, which were all of the kindergarten classes in the school system, were involved in the program.

The presentation of the program for grades one through six consisted of three separate phases: orientation, field trip, and follow-up. A total of 166 classes, from all elementary classes, participated in this phase of the program.

The total number of elementary classes in the Ann Arbor Public School System is 302. During the first year of operation 221 of these classes, or 73 percent of all elementary classes, were involved in the program.

In addition to the regular elementary phase of the Outdoor and Conservation Education Program, the program coordinator was requested by elementary teachers to make thirty-three classroom presentations and thirty-four assembly presentations.

In the operation of the secondary phase of the program, the program coordinator was available throughout the school year to assist the secondary science and social studies teachers by giving classroom presentations on any conservation topic they requested, to prepare conservation resource material for their usage, and to assist them in other related ways. Although the program coordinator was available to assist any secondary teacher during the school year, the program coordinator's time was primarily devoted to the secondary program during the winter months.

In addition to preparing, mimeographing, and distributing conservation material to the secondary teachers, the program coordinator was requested by secondary science and social studies teachers to make 110 classroom presentations, two assembly presentations, and nine field trip presentations during the first full year of the program's operation. The program coordinator was also requested to make nine presentations to science and social studies clubs.

The in-service training program for teachers was directed at helping teachers to increase their understanding, interest, awareness and teaching skills in conservation. During the first year and a half of operation the program coordinator made fourteen grade-level presentations, ten inter-grade-level presentations, twelve building presentations, assisted thirteen classroom teachers with conservation projects and prepared and distributed material on twenty-one conservation topics.

Although the major emphasis of the program was directed at the students and teachers of the Ann Arbor Public School System, the program coordinator accepted requests to make presentations to local community organizations to help inform and arouse interest of local citizens to their civic responsibility of being informed and taking an active interest in local, state and national issues. The program coordinator also welcomed the opportunity to discuss the Outdoor and Conservation Education Program with parent-teacher organizations so that the parents will be better informed as to the general nature and purpose of the program. During the first year and a half of operation, the program coordinator made thirteen presentations to parent-teacher organizations of the Ann Arbor Public Schools, eighteen presentations to miscellaneous local organizations and two radio broadcasts.

The program coordinator also accepted requests to make presentations to organizations and school systems of neighboring communities in order to assist teachers and administrators that are considering a total conservation program for their school systems. During the first year and a half of operation, the program coordinator made twenty-two presentations to schools and organizations from other communities and eight presentations to state organizations.

This study shows that conservation education can be effectively taught when it is integrated into the existing curriculum of a school system (K-12). I know of no study comparable to this one which has been made of the effectiveness of conservation education when it is isolated as a specific course at some particular grade level. I strongly believe that conservation education can be more effectively taught when it is integrated into the existing curriculum of a school system (K-12) than when it is isolated as a specific course and offered at a particular grade level. Furthermore, I believe as a result of this study that the integrated approach to conservation education could be made even more favorable to a school system if conservation education could be integrated into a school system's existing curriculum in a manner that would compliment and enhance its existing instructional goals.

I also strongly believe that if there were a demand for conservation consultants in our country, able students with a genuine interest and high competence would be attracted to an institution offering the proper training and would enter the field of conservation education.